



INTER-LINKING OF RIVERS: UNREALISTIC EXPECTATIONS

By *Ishika Chattopadhyay*
From *Department of Law, University of Calcutta*

Introduction

In a country that worships and reveres its rivers, it would be logical to imagine pure, serene waters flowing freely. The true picture, however, is quite different. Not only are the rivers amongst the most polluted ones in the world, but also their flow is going to be controlled and modified according to human wishes, through the government's initiative- interlinking of rivers.

This article speaks about the chronological development of this idea- when and why it originated and how it has changed over the years. It includes the basic outline of how the project is going to be implemented and also the pros and cons of this project, while highlighting the impacts it will have on the environment, economy, people, legal framework etc. The article also focuses on similar projects that have been carried out in other parts of the world, how those have affected the river's ecosystem and what lessons we can learn from them. There is also a discussion on the benefits of the project but whether and how sustainable those are capable of being. Finally, there are a few suggestions as to how we can maximize the good effects of river interlinking while not causing too much harm to the environment.

Rivers have been lifelines to human beings since ancient times- starting from the

Indus valley civilization, Mesopotamian civilization, etc. to the modern day industrial and agricultural hubs. Altering of the course of a river has huge impacts on the ecosystem that survives on it, to the extent that it has been the cause of the decline of certain civilizations and the rise of others.

The interlinking of rivers in India has come up in the news recently in the wake of the recent floods that hit the country. This concept, however, has been around for about 150 years now.

In the nineteenth century, Sir Arthur Cotton, a British engineer suggested this process of interlinking the Indian rivers so that imports and exports could be carried out through the rivers. It was also believed that this interlinking of rivers could solve the problem of the cycle of droughts and floods in the country. Dr. K.L.Rao, an Indian engineer and politician, in 1972, suggested that the Ganga and the Kaveri be linked. His idea was supported again a few years later in 1977 by Captain Dastur, a pilot, who said that there is a contour which could be used to connect the Himalayan rivers and the Peninsular rivers.¹ Though this plan was never carried out, it kept resurfacing now and then.

Captain Dastur's plan was revived during the 1980s. Under Indira Gandhi's regime, the National Water Development Agency (NWDA) was constituted which comprised of nominated experts and was entrusted with the responsibility of coming up with reports on the feasibility of interlinking of rivers. This idea once again

¹ <http://www.livelaw.in/interlinking-of-rivers-violation-international-environmental-law/>



gained wind when in 2002 a PIL was filed in the Supreme Court. It ruled that the planning of this project was to be completed by 2006 and the project itself was to be executed by 2016. Needless to say it could not be executed within this impractical deadline and lost its enthusiasm midway.

Outline of the Plan

The Ministry of Water Resources in 1980 published a report titled “National Perspectives for Water Resources Development”. In this report a rough plan of this project was sketched out.

The project was to be composed of two components-

- The Himalayan component
- The Peninsular component

The Himalayan component comprised of mainly connecting the Ganga and Brahmaputra rivers. This includes connecting their principal tributaries like Kosi, Gandak etc. The Peninsular component comprised of connecting the five main rivers of Southern India, that is, Mahanadi, Godavari, Krishna, Pennar and Kaveri.²

Aims of the project

The project is based on the hopes of constituting India into a grid of inter-connected rivers where the surplus of one river would feed the dearth of another, thereby solving India’s eternal problem of floods and droughts. However ambitious these objectives may sound, we need to look into the feasibility of this gargantuan plan, to see whether this will end the water related

issues of the country or push it into further woes.

Environmental Issues

Since we are talking about joining rivers, the first issue to take into consideration is its environmental consequences. The first step in connecting rivers is the building of dams and canals and thereby diverting the water from its natural course through an artificial channel in another direction. When we build a dam on a river, we obstruct its natural flow and store a certain quantity of its water, allowing the remaining water to flow. The area around a river becomes so fertile and abundant in water and excellent for agriculture because of the presence of aquifers (an underground layer of water). Now when we build dams across a river and divert the water from its original course to some other channel, less water can permeate into the underground aquifers, which ultimately results in slowly drying up the previous basin at the downstream of the dam.

Another problem with dams occurs when the rivers keep depositing silt at the bottom of the reservoirs. This reduces the height of the dam and ultimately they become redundant. So if we change the entire grid of water in the country and create a completely new grid and this new grid becomes non functional after some time (owing to the silting up of the dams), this would ultimately leave the water resources of the country in a completely messed up situation. This could also result in the desertification of the entire country.

Legal Issues

² <http://www.thehansindia.com/posts/index/Civil-Services/2017-09-29/Interlinking-of-Rivers-Benefits-and-Challenges/329838>



- One major issue with the interlinking of Himalayan rivers is that whether or not it violates the Ganges Water Sharing Treaty 1996 between India and Bangladesh.

This treaty mandates that India and Bangladesh are supposed to share international waters in a “fair and equitable” manner. Through the construction of the Farakka Barrage, the provisions of the treaty have already been violated. And now with the interlinking of rivers, there is immense apprehension that there will be further violations of the treaty. Bangladesh is an agrarian economy and very much prone to natural disasters. Through the interlinking of rivers, if we divert any of the water it was previously receiving; it will hit the economy hard, and also cause severe damage to the fisheries of the country as well as the Sunderbans which serve as the home to many endangered species.

- Under the Constitution of India, water is a state subject, vide List II of the Seventh Schedule. While mentioning the subjects over which the states have jurisdiction, under Entry 17 the following are included- “water, that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and water power”.

However, our Constitution also mentions that inter-state rivers or waters are within the jurisdiction of the centre. That is why under Entry 56 of the Union List the following are included- “regulation and

ontrol of inter-state rivers and river valleys”.³

Given the inter-state and centre-state political situation in our own country, next we have to think about whether or not this project would be possible to implement. To connect the rivers the pre-requisite is that there should be complete cooperation between the state governments and the central government and also amongst the state governments themselves. It is, however, quite unlikely that such cooperation may take place. On the other hand every state will most probably try to prove that it is itself water deficient and thus oppose any diversion of water from its territory.

There are already numerous such instances where states have been involved in disputes regarding sharing of river water. The first that is to be mentioned in this respect is the Cauvery water dispute between Tamil Nadu, Karnataka, Pondicherry and Kerala. This dispute has been going on since 1892 when the first agreement was signed between the Madras presidency and the princely state of Mysore. The disagreement had reached such heights that a separate tribunal (Cauvery Water Dispute Tribunal) had to be created. There were similar disputes regarding the waters of Godavari, Krishna, Damodar, Narmada, Vansadhara and many others.

Another problem that we have to encounter in executing this project is the issue of land acquisition. In order to build the required number of dams and reservoirs and canals, a

³ http://wrmin.nic.in/writereaddata/06_Inter-Linking%20of%20Rivers%20and%20legal%20aspects_APratap.pdf



large number of people will have to be displaced from their homes. According to a report by Upali Amarasinghe,⁴ almost half a million people will lose their homes and grounds for this project to be implemented. With the already enormous costs of the project and the population pressure of India, it would be very difficult to get those people rehabilitated and compensated. If they lose their homes and their livelihoods, they will ultimately end up in slums in the cities.

Economic Issues

The next important issue to be considered is whether this project will be economically feasible.

In 1977, Captain Dastur estimated that the cost for carrying out the project would be Rs. 24,095 crores, but an expert committed estimated the cost to be about Rs. 12 million crores, which at 2002 price level would be a whopping Rs. 70 million crores [2]. This cost is however the primary amount required in carrying out the project and does not include the subsidiary costs like that of compensation to people who will be displaced or restoration of the ecosystems harmed in the process. Now the question is from where will the government be able to procure that amount of money and even if it does, will it be cost-effective?

Yes, this project promises that a huge amount of hydro-electricity will be produced, a large area of irrigated land will be created but all these claims are subject to doubts. These cost advantages will not be enough to compensate for the project establishment costs as well as the running

costs. Also, we need to think whether this is sustainable in the long run or not. Dams, which are necessary for this project, have a finite lifespan of about 50-100 years. After that time, due to various reasons like concrete cracks, failing buttresses and other structural wear and tear, the dams start deteriorating. In addition to these, there is a major concern which significantly reduces the life of a dam. That is sedimentation by the river, which deposits sand and silt at the bottom of the reservoir, thus slowly reducing its capacity.⁵ This problem has been worsening because of deforestation in the upstream region, which accelerates soil erosion and which in turn accelerates the silting of the dam. Even if the river interlinking project is carried out, there is no guarantee as to how long that will be properly functional. So we need to consider the long term effects and sustainability of this plan instead of relying merely on the short term benefits.

Geographical Barriers

The concept of linking the flood-prone Himalayan rivers with the peninsular rivers to provide water to the drought-prone Deccan plateau may not be possible because of the presence of the Vindhya mountains. It will not only be very difficult to lift the water from the northern plains and bring it to the Deccan plateau over the Vindhya mountains, but it will be extremely expensive. It is highly doubted whether incurring of such enormous costs is at all necessary.

Meanwhile China has been discreetly implementing its river interlinking project

⁴https://cgspace.cgiar.org/bitstream/handle/10568/3776/PN48_IWMI_Project%20Report_Aug09_final.pdf?sequence=1

⁵https://www.teachengineering.org/lessons/view/cub_dams_lesson08



for almost a decade now, and since they are not bound by any water sharing treaty as an upper riparian state, it can divert the water of the Brahmaputra. In that case India might also have to rethink the Himalayan component of the project which involves the Brahmaputra.⁶

Ecological Dilemma

The basic idea on which this project is based is that through inter-basin river linking, the water from a surplus basin will be diverted to a dry basin. But more or less all the rivers in our country flood at the same time, that is, during the monsoons. When there is surplus water in the rivers of the northern plains, simultaneously there is enough water in the rivers of the Deccan plateau. Therefore, it would be of no use if the water is diverted at that time. Also, during the dry season, both the regions face the same situation. So if water is diverted from an apparently 'surplus' basin to a recipient basin in the dry season, then though the recipient basin will benefit, the donor basin will suffer.⁷

For example, there is a plan to divert some of the water from the "surplus" Godavari basin to the "deficient" Krishna basin, but this will harm the Godavari basin tremendously. This is because the Marathwada region in Maharashtra is one of the worst drought-stricken regions in India and it belongs to the Godavari basin. So diverting water from the Godavari will worsen the situation further.

One of the primary objectives of this project is to facilitate irrigation and boost

agriculture. The main water source for agricultural purposes, however, is not river water. It is underground water. The bulk of the water used for drinking and industrial purposes as well comes from underground water. So if we want to help our farmers in times of drought, or help those places which suffer from lack of drinking water, we need to make sure that the underground water is adequately replenished. Inter-connecting rivers would not be of much help in that respect. In fact, this would do quite the opposite.

Again, since these underground aquifers are not being adequately recharged, another problem emerges. That is concentration of Arsenic and Iron salts in underground water. This poses a severe threat to public health.

With the inter-linking of rivers, we aim to stop the floods but what we forget is that they are not completely bad for the environment. Firstly, floods help spread fertile alluvial soil which helps agriculture. Secondly, the excess water of the flood goes into aquifers, thus replenishing the water that we regularly draw out. Flooding is essential for the floodplains and deltas. If not for the occasional floods, sea water would get into the aquifers and ground water would become unsuitable for drinking.

Another opinion is that the presence of more fresh water in the delta actually helps in bringing the monsoon rainfall to the country. If we artificially stop the natural flooding of our rivers, this could ultimately lead to desertification and desiccation.

The desiccation of the Aral Sea

⁶ <http://www.dailypioneer.com/columnists/oped/river-linking-lessons-from-china.html>

⁷ <http://www.indiawaterportal.org/articles/link-or-not-link-debate>



The gradual drying up of the Aral Sea in Central Asia can be cited as an example of this phenomenon mentioned above. Until the 1970s, the Aral Sea was the fourth largest saline lake in the world. It was fed by two rivers- the Amu Darya and the Syr Darya. But things started changing when the Soviet government decided to divert the course of the rivers, so that water could be provided to the desert region surrounding the Aral Sea. The incidents that followed could very well taken as a warning as to what might happen if we decide to carry out this feat in India.

Since the waters that would feed the Aral Sea had been diverted away, the first consequence was that the water content of the Aral Sea went down by 23 meters. Also since the water content was reduced considerably, the salt content increased from 10g/litre to 100g/litre. The water reduced so much that the Sea got separated into two parts. All of this in turn resulted in melting of glaciers, increase of sea surface temperature, frequent dust storms and salinization of the soil. The subsoil dried up and the ground water level also declined significantly. The area ultimately suffered extreme desiccation and desertification. The plants died as a result of increased salinity and vegetation was reduced by 40%. Six million hectares of agricultural land was destroyed.⁸

Fate of the Kissimmee river

Another example can be drawn from what happened to the Kissimmee river in Florida. In 1947, a massive hurricane hit Florida and caused the Kissimmee river to flood. This caused a lot of damages and the

citizens there requested the government to take steps so that such floods do not occur in future. Thus the government channelized the river. This has since then damaged the river and its basin. Its floodplain has dried out, the level of pollution in the river and the number of fishes and birds dwindled having lost their natural habitat.⁹

Ecosystem will be affected

A river is not just a pipeline of water. It is an ecosystem in itself, containing aquatic animals and plants. There is also different flora and fauna throughout the course of the river, and which are completely dependent on the river for their existence. There are forests that are fed by the river water, there are animals and birds along the course. Where will they go? We think about the rehabilitation of the people who will be displaced if we artificially change the course of a river but how do we provide the same for the flora and fauna who will be losing their natural habitat?

According to a study by a team of scientists from the Indian Institute of Technology, Bombay and Madras, there is a high possibility that the dry areas of India are going to receive more rainfall while the comparatively wetter areas will receive lesser rainfall. They have also said that the water yield in previously surplus rivers is decreasing while that in deficient rivers is increasing. If that is the case, then inter-linking of rivers will not be of much use.

Ken-Betwa Link

Among the 30 proposed links between rivers, the first that is being implemented is the Ken-Betwa link in

⁸ [://www.columbia.edu/~tmt2120/introduction.htm](http://www.columbia.edu/~tmt2120/introduction.htm)

⁹ https://en.wikipedia.org/wiki/Kissimmee_River



Madhya Pradesh and parts of Uttar Pradesh. This project proposes to divert some of the surplus water from the Ken river (also known as the Karnavati) to the Betwa, which will irrigate an area of over seven lakh hectares in the drought prone Bundelkhand. The major portion of the project will be implemented in three years.

¹⁰ Though it is agreed that the successful implementation of the Ken-Betwa link will benefit the people of Bundelkhand region by solving their water problems, ecologists however expressed concern over the impacts of this project on the environment. Yes, it will relieve the people who have been facing severe scarcity of water for a very long time, but the question is whether that benefit will be sustainable. The Ken-Betwa link will invade the core area of the Panna Tiger Reserve. Not only will it submerge more than 4000 hectares of the tiger reserve and a total of 9000 hectares of the forest land, but it will also cause loss of habitat to the vultures and the fish-eating crocodile gharial. A total of seven lakh trees will be submerged due to this project.

Now moving on to the economic aspect of this particular link, it has been estimated that ninety percent of the expenses that will be required for this project is going to be well over Rs. 18000 crores. Since this project involves the states of Uttar Pradesh and Madhya Pradesh, both of these states were naturally wary of the huge costs this is going to incur. Previously it was agreed that 60 percent of the funding will be coming from the centre while 40 percent will be provided by the states. After further

discussions, however, it has been decided that the expenses will be distributed between the centre and the states in 90 (centre): 10 (state) pattern.

This linking will also necessitate the removal of almost 2000 families from 10 villages.

Benefits of Inter-linking

The supporters of this plan put forward the following argument. India receives 4000 cubic kilometers of rainfall every year, which amounts to 1 million gallons of water for each person in a year. Apparently this might give an impression that we get more than enough water but the real scenario is quite different. This is because 85 percent of the total rainfall is concentrated over a small area- the Western Ghats, the North-Eastern part of India, and some parts of the Gangetic plains. Moreover the precipitation does not happen gradually throughout the year. It happens mostly during the monsoons, which is usually just three months- July, August and September. The rest of the year is more or less dry. There are also some regions of the country, like the Deccan plateau and Western India, which receive extremely scanty rainfall even during the monsoon months. Since there is such a stark difference between the distribution of rainfall in different parts of India, the networking of rivers will be quite beneficial for the people, especially the farmers.

The Northern plains of India have forty four percent of the country's population but use sixty percent of the water resources. On the other hand, the Deccan plateau has seventeen percent of the population but use only six percent of the

¹⁰<https://timesofindia.indiatimes.com/india/centre-to-fund-90-of-cost-to-get-ken-betwa-linking-started/articleshow/62666856.cms>



total water resources. This unequal distribution of water resource utilization calls for the interlinking of rivers, which will provide water to the deprived people of Southern India.

Moreover, India is mostly an agrarian economy. Seventy percent of the country's population lives in rural areas and are completely dependent on agriculture. In this scenario irrigation is extremely important. Our farmers suffer a lot due to the floods as well as the droughts. So if the interlinking of rivers can stop this cycle, it is very much welcome. There is an increasing concern expressed by people that the "donor" basins will become dry but the project proposes that only the excess flood water will be diverted and not the main water of the rivers.

This project will not only facilitate agriculture but also produce a lot of electricity- approximately thirty four thousand megawatts of hydro electric power. Construction of a large number of dams will facilitate production of this electricity.

Conclusion

Interlinking of rivers can be both a boon and a bane to the country. On one hand it poses many threats to the environment and on the other, it may prove to be a blessing for all the places suffering from floods and droughts every year. However, there remains a question as to why such an extravagant affair is being taken upon before trying the many other easier mechanisms of water conservation and irrigation.

One of the easiest and most effective methods of water conservation is the

creation of ponds. Apart from being an excellent mechanism for rainwater harvesting, a pond is an ecological unit in itself, and is very good for biodiversity. Ponds support aquatic life as well as terrestrial species like insects and small animals; they provide drinking water during the dry season and nurture the plants in its surroundings. Thus it would be advisable that adequate number of ponds be set up in villages to hold rainwater. Not only ponds, all other methods of rainwater harvesting should be applied.

Most of our rivers are extremely polluted. The number of polluted rivers in India has risen from 121 in 2009 to 275 in 2015. In spite of the mythological significance of rivers in our country, we have not been able to maintain their purity and cleanliness. The Yamuna is the most polluted river in India and among the top ten most polluted rivers in the world. The holy Ganges is not far behind, with 32 drains emptying their sewage into the river. The other rivers also face similar situations. Under these circumstances, would it be wise to join a more polluted river to a less polluted one? Or should we first try to restore the health of our rivers before experimenting with them?

Before we go about with such a gigantic project, it would be wise to carry it out at a smaller level, that is, intra-basin river networking. We should observe how that impacts the environment and if circumstances show positive results, we can implement the national river interlinking project with more certainty and confidence.
